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ABSTRACT

An effective test and measurement course in psychology should expose students to a variety of available psychological tests, as well as to the mechanics of test construction and evaluation. In a test and measurement course at the State University of New York's College at Cortland, the course is divided into two components with an overlaying group project. In the first component, students are introduced to fundamental concepts of test design, construction, and evaluation. In the second component, students use these fundamental concepts to evaluate the classic tests in each of the areas represented in psychological measurements. For the group project, students form groups of five members, with each member becoming an "expert" in one of the upper levels of Bloom's taxonomy of cognitive domains (i.e., comprehension, application, analysis, synthesis, and evaluation). Each group develops a test consisting of one question each from the five levels and critically review other groups' tests. The new measure is then validated and administered to a group of subjects along with a second external measure. The approach effectively reinforces the fundamentals of test construction and evaluation, introducing students to one measurement domain in great depth and provides students with the opportunity to work in interrelating, collaborative groups. An organizational chart of the test-creation project is appended. (TGI)

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Teaching a Test and Measurements course by developing a measurement instrument

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Balancing coverage of the range of core topics with in-depth coverage of selected issues is a major concern in designing a Test and Measurement course. Many courses and texts in this area look like lists of tests in print. Students are presented with descriptions and examples of literally hundreds of tests designed to evaluate intelligence, personality, academic aptitudes, vocational preferences and a host of other individual dimensions. At the other extreme some texts bombard students with advanced statistical formulas, seeming to imply that a course in Test and Measurements is nothing but an applied statistics course. I feel that it is important to integrate these two approaches so that students gain an appreciation of the variety of available psychological tests, and an understanding of the mechanics of test construction and evaluation.

My Test and Measurement course is divided into two content components with an overlaying group project. In the first phase of the course I introduce fundamental concepts of test design, construction and evaluation. Students read about, and discuss in class, issues related to item generation, standardization of administration and scoring procedures, establishment of norms, the appropriate use of the various measurement scales, factor analysis, item analysis, and methods for determining reliability and validity. In the second phase students use these fundamental concepts to evaluate the classic tests in each of the areas represented in psychological measurements.

I feel that this progression from the general to the specific provides a sound initial introduction to the domain of test and measurements. However, I want my students to more thoroughly appreciate the mechanics of test construction and I believe the best way to do that is to have them actually create a test. I use depth of cognitive processing as the focus of this exercise. Students are introduced to the wealth of theories and associated measures that exist in this domain. They are then set the task of developing a test that operationalizes Bloom's Taxonomy of the Cognitive Domain (1956).

In order to develop the Bloom measure students work in "core groups" of five. Each member of the group selects one of the upper levels of the taxonomy (comprehension, application, analysis, synthesis and evaluation) that they wish to become an "expert" in. These individuals from each of the "core groups" (usually five per class) form "expert groups" to study their specific level. This means that each student is actually a member of two working groups simultaneously, the "core group" and the "expert group". Individual students are responsible for creating one set of questions (usually a paragraph situation with five objective questions) that represents their level of expertise. The "core group" then works together to produce a cohesive test consisting of five questions, one representing each level. These tests are then exchanged with other "core groups" for critical review. Groups determine if the questions they are reviewing represent the level of the taxonomy they were designed to measure, if they are bias free and conform to the requirements of sound test construction discussed in class. At this point each group selects the three questions per level that they feel are best constructed. (See attached figure for a graphic representation of the entire process.)

After the test is developed each "core group" selects one of the components of validity as outlined by Messick (1995) that they wish to use to validate their new measure. In order to accomplish this one of the groups develops a thorough description of the construct of depth of cognitive performance. A second group develops a model of the predicted scoring patterns based on Bloom's theory. A third group determines appropriate alternative measures to use to establish the external aspects of validity. A fourth group examines the issues surrounding generalizability of the new measure. The fifth group focuses on the possible consequences of the use of the new measure.

The new Bloom test is then administered to a group of subjects along with a second (external) measure of learning style. The results of the two tests are compared to determine criterion validity. The results of the Bloom test are factor analyzed to ascertain whether or not the predicted factor structure exists. The results are also subjected to item analysis to examine the power of each item.

This project design accomplishes several of my goals. It reinforces the fundamentals of test construction and evaluation and introduces students to one measurement domain in great depth. This project also introduces the students to working in interrelating collaborative groups while reinforcing the content components of the course. Each member of each group must contribute a critical component of the group project. This model allows for individual and group accountability and assessment of performance. Finally, to ensure that each group member is familiar with all aspects of the project, questions concerning the development process, the theoretical underpinnings, and the interpretation of the specific results of the tests form the basis of the final exam in the course.

References

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Test Creation Project